



Mechanization comes to the harvesting of red tart cherries

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The red tart (sour) cherry industry is in the midst of a major revolution—the complete mechanization of harvesting and handling is now an accomplished fact. In the next few years machine harvesting will spread to all red tart cherry areas and will be used for many other fruits, including sweet cherries for processing.

Candy manufacturers are watching this new development with interest because it affects the quality and availability of some of their raw materials. The candy industry uses large quantities of processed cherries—maraschino, candied, or glacéed. Most of these products are prepared from brined sweet cherries, but a substantial volume is derived from brined red tart cherries.

Until recently, cherry harvesting was done entirely by hand. The pickers are paid by the pail and the fruit is emptied into lug boxes for transport to the factory. Loading and unloading the boxes not only require a lot of hand labor, but also cause long delays in the orchard and at the processing plant. Since this occurs during the hottest part of the summer, it often causes damage to fruit quality in the form of softening or discoloration. At the factory the cherries are soaked six hours or more in cold water to “firm” them prior to sorting and pitting.

Small orchards can usually recruit



FIG. 1. A mechanical harvester can harvest 30 to 40 trees per hour, doing the work of 100 men at half the cost.

enough pickers from neighbors and from near-by towns. Large orchards in Michigan, Wisconsin, and New York state cannot recruit enough local pickers, but must rely upon an army of migratory workers. For example, Michigan, the principal red tart cherry producing state, required 3,000 cherry pickers each year prior to the introduction of the mechanical harvester.

Prototypes of the present mechanical cherry harvester were developed by two groups of agricultural engineers: A USDA team at Michigan State University, East Lansing, Mich., and a Cornell University group at Ithaca, N. Y. The most popular present harvester (Fig. 1) was developed by the Friday Tractor Co.,* Hartford, Mich. and represents a modification and refinement of the earlier models.

Each unit consists of two halves, each with a hydraulic shaker and a 13 ft. by 26 ft. catching frame mounted on wheels and driven by an 18 HP motor. The frames move into position on opposite sides of the tree and the shakers clamp on to each of the major branches. A two to three second “shake” at 1200 R.P.M. using a two-inch stroke will remove 95 to 99 per cent of the fruit.

A conveyor belt transports the fruit to a tank of cold water holding 1000 lbs. of cherries. A crew of five men—two operating the harvester and three hauling tanks of cherries, can harvest 30 to 40 trees per hour, doing the work of more than 100 pickers.

On the average, machine harvested cherries are bruised only slightly more than hand picked fruit. By hauling the cherries in tanks of cold water, the fruit is cooled promptly and is cushioned against further bruising. Such fruit reaches the factory in better condition than hand-picked cherries hauled in lug boxes.

about the author

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* Mention of company or trade names does not imply endorsement by the Department over others not named.

Harvesters can operate during rainy weather, and even at night, thus insuring a steady flow of fruit to the factory. But most importantly, machine harvesting has solved the picker shortage and reduced the cost of harvesting from three cents per pound to less than 1.5 cents.

Machine harvesting has stimulated a whole series of related developments: water hauling, automatic weighing, mechanical destemming and electronic sorting. It is now possible to completely mechanize the industry so that cherries are not touched by human hands from the tree to the final processed product.

Water hauling created a problem in weighing loads of cherries. This has now been solved by automatic scales using endless wire-mesh belts (Fig. 2). Cherries are emptied into a small tank at the foot of a conveyor belt which elevates the fruit to the scales. From here the fruit goes to coldwater storage tanks to be firmed prior to sorting and pitting.

Machine harvested cherries contain two to 10 per cent of attached stems, as compared to less than one per cent for hand picked fruit. The removal of these stems requires a lot of hand labor, and slows down the processing lines. This problem has been solved by the development of a simple, inexpensive mechanical destemmer.

Sorting out defective fruit prior to processing is a critical operation in maintaining a high quality of product. Formerly this required a large area for inspection belts and a large crew of women to do the sorting. This was painstaking work and the efficiency of operation went down as the workers get tired, or if the belts were overloaded with fruit.

Cherry sorting has now been automated. Fig. 3 shows a battery of eight electronic sorters. Each machine is capable of handling one ton of fruit per hour, 24 hours a day. Cherries are picked up by suction cups on a rotating wheel. A series of electronic eyes scan the fruit for color and activate a mechanism to reject any defective fruit. These machines do an excellent job and at less cost than hand sorting. One large factory in Michigan has replaced 100 women sorters per shift with 32 electronic sorters. This development has done much to improve the quality of processed red tart cherries.

Within a few years the red tart cherry industry will be completely mechanized as the revolution in harvesting, handling, and sorting spreads to all commercial cherry growing areas. The net effect will be reduced harvesting costs for the grower, improved quality control for the processor, and better products for the consumer.

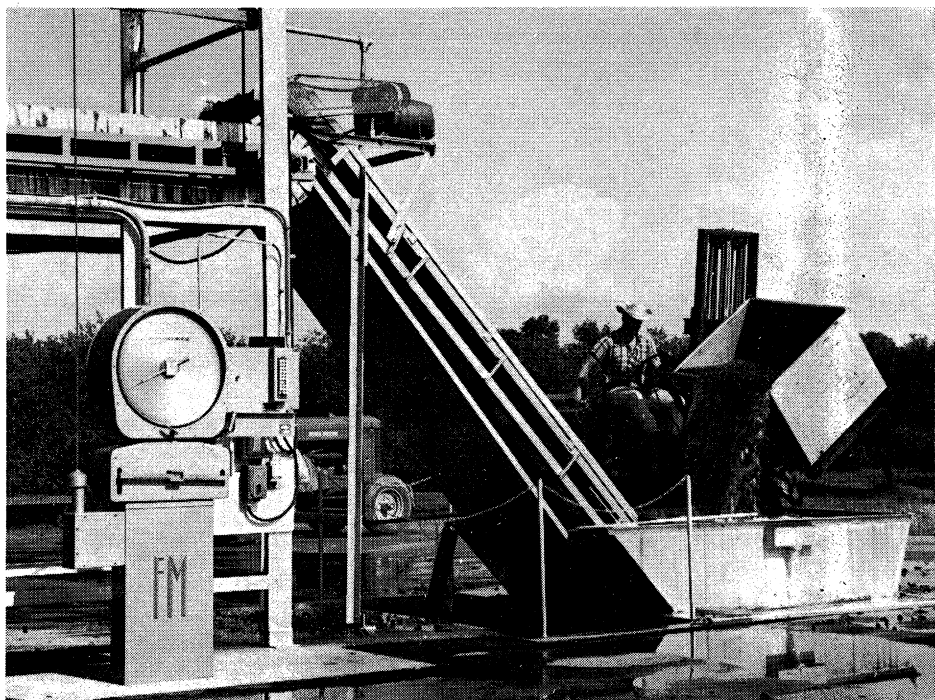


FIG. 2. In automatic weighing, a fork-lift empties tank-load of fruit into a water-filled boot. Cherries are elevated to the automatic scales.

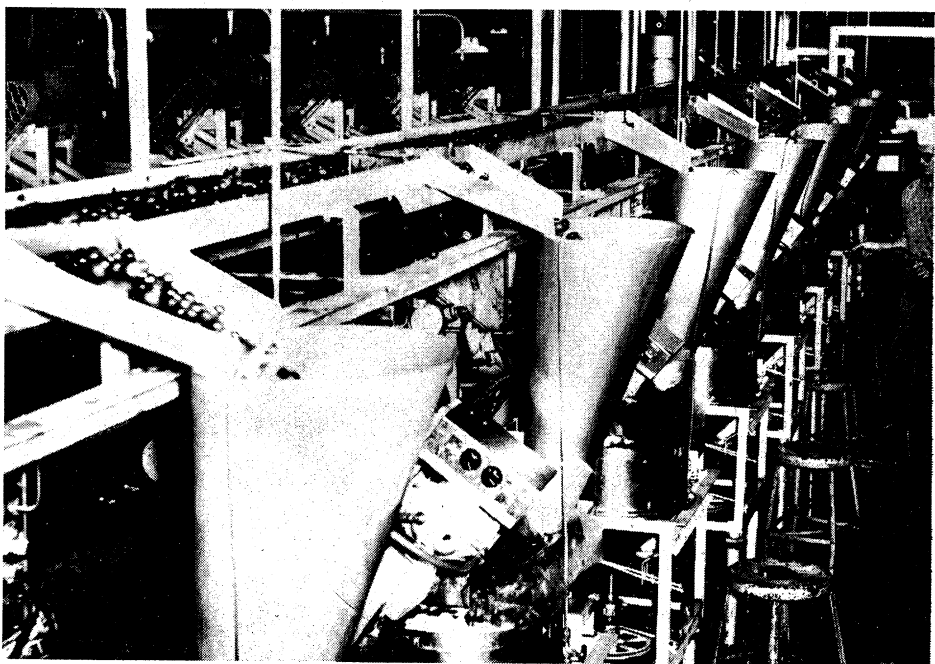


FIG. 3. Battery of electronic sorters does a better job at less cost than old-fashioned hand-sorting.